

TRIP REPORT

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Project 182-B

This report covers the installation and maintenance of equipment built by HRB on Project 182-B and results obtained through operation at the site in Adana, Turkey. The arrival date in Adana was 27 May 1959. The equipment had arrived the previous week and was found to be in operating condition.

A test flight was made on 29 May to check airborne operation of the gear. The automatic "turn-on" of the gear was found to be sensitive to a frequency shift keying transmitter operating in the 72-76 mc region located on the base. The twelve minutes of tape was expended in approximately fifteen minutes by false lock-ons of one to two minute intervals repeating immediately. Adjustments were made to slice levels and sync pulse integration time and the second flight test was made on 3 June. The twelve minutes of tape lasted almost one half hour on this test. The difficulty was found in the narrow band filter on the sync pulse rate. This filter was sensitive to all harmonics from 500 cps to 20,000 cps. An inhibitor was devised and installed on the extractor boards to inhibit all harmonics of 500 cps. Another flight test was made on 5 June with a duration of four hours. The tape lasted two hours with no "false lock-on" longer than 10 seconds. These lock-ons occurred over areas of relatively high signal density, (Adana Air Base, Ankara, etc.) Further increase in sync pulse integration time was made, increasing the integration time to 0.4 seconds. The first live mission was flown 9 June at night. The equipment operated satisfactorily expending six minutes of tape in six hours of which approximately five minutes was signal. The low number of false "lock-ons" was considered at the time to be very unusual and subsequent flights have shown that the number of false "lock-ons" depends on the time of day, which no doubt determines the signal density in the target area to a considerable extent.

A log was kept at the site describing all missions flown. However, this log was not removed from the site and no data concerning dates of missions and results was carried by this person on subsequent travels through Europe and the Middle East. Therefore the dates on subsequent missions are somewhat hazy.

The next live mission occurred in early July and at the time was considered by me to be a partial success. Operation of the automatic "turn-on" was somewhat erratic during the signal. It was determined that approximately two minutes of signal was obtained. Post flight checks showed no reason for abnormal operation except that sensitivity was down 3 db on the 56 mc receiver and down 10 db on the 76 mc receiver. This reduction in sensitivity was caused by changing receiver frequencies just before the flight while the gear was in the plane where a thorough check on operation was not possible. The difficulty arises because the preamp noise figure is not constant over the band. The new receiver setting on 76 mc had a lower noise figure than the previous setting and consequently reduced the rms noise level into the video processing gear. This required a new slicing level on the crystal ball of which we were not aware at the time. Correct operating procedure to prevent this difficulty from reoccurring was initiated immediately.

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The next live mission occurred in the middle of July during the week of the 15th. An equipment failure was encountered. The fuse in the -3 volt power supply for the video processing gear blew immediately on application of power to the "A" frame. This fuse disabled the automatic turn-on gear and the mission results were nil since no tape was expended. A post flight check, after the blown fuse was replaced, showed the gear to be functioning properly. The blown fuse was believed to be caused by delayed application of power to the equipment. This was a mistake in operating procedure brought about by a misunderstanding of a cable sent to the site. Steps have been taken to prevent this occurrence again.

The fuse was replaced and a test flight made in which the gear functioned properly. The tape was expended during five hours of flight time in the local area.

The next live mission was flown during the last week in July. The same fuse blew again causing complete failure of the mission. This caused doubts as to the reason of failure of the fuse on the previous live missions. Suspecting damage to the supply internally (the supply is hermetically sealed) the power supply unit was replaced. Ground checks showed the fuse had a 100% safety factor in current capacity. This safety factor was increased to 200%. Another test flight was flown with normal operation again.

The next live mission was the first week in August in which the gear operated normally but no signal was obtained. A three amp fuse flew in the Ampex electronic power supply for seven of the fourteen channels. This failure was due to a stalled blower motor. The blower motor was replaced. Two more live missions were flown in the next four days with the equipment functioning properly, it seemed, but results were nil.

Those flights were the last in which this representative participated.

Results obtained during the two and one half months showed that the gear was capable of performing as expected although little could be done at the site to determine quality of the take to any great extent. Turn-on sensitivity was found to be consistent at -97 dbm or better on all receivers. The two higher frequency receivers turn-on at -99 or -100 dbm because of a lower preamp noise figure at these frequencies. Turn-on sensitivity was, in all instances, approximately one to two db higher than receiver tangential level. The above sensitivities were subsequently used as a standard of checking optimum adjustment of the gear. Difficulty was encountered in operating the System I recorder in conjunction with the Ampex recorder since the Ampex unit recorded the tape bias from the System I recorder. A filter was installed between the two to correct this problem. Additional problems were encountered recording pilot's comments from the AIC-10 on the System I unit. This problem was solved by detachment people by modification to the hook-up arrangements.

Major difficulties appeared when advance notice, or lead time, was decreased. These difficulties forced a revision of the operating procedure. A maintenance man was required to be on standby at all times to install the gear in the vehicle as the vehicle was used for other missions and the gear was taken out after flight. The installation time was reduced to thirty minutes and thus was not a problem as far as operation was concerned. The major problem was pre-breathing for the

pilot. This difficulty may be reduced to some extent by a different utilization of information obtained from Det-50. In several instances a rather vague expectancy was obtained from Det-50 which indicated a possible operation in the next 48 hours. An investigation might be made as to the possibility of rotating pilots "on the hose" during this period of time. Of course, this may not be possible. Another method may be helpful in which the pilot remains at low altitude while traveling to the target. This again may have problems of which I am not aware. However, at the time I departed from the location, operation was very tight and time was short but not impossible.

I was very much impressed with the operating personnel and their capabilities. Also the cooperation between detachment people and military people was excellent. The military organization under Colonel Bierly, the detachment people under [] and the Lockheed people form a very smooth running and competent unit.

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